Patent Claims

1. A polypeptide that hydrolytically cleaves zearalenone and/or at least one zearalenone derivative, characterized in that the polypeptide is a hydrolase with an amino acid sequence ID No. 1 or a functional derivative thereof, wherein a sequence identity of at least 84 % exists between the functional variants and the amino acid sequence ID No. 1, and wherein the functional variants hydrolyze zearalenone and/or at least one zearalenone derivative.

2. The polypeptide according to claim 1, characterized in that the polypeptide has at least one conserved amino acid sequence segment or a functional variant thereof, wherein the functional variant of the amino acid sequence segment has a sequence identity of at least 84 %, preferably at least 92 % and more preferably at least 98 %, and at least one conserved amino acid sequence segment is selected from the group of amino acid sequences +24 to +50, +52 to +77, +79 to +87, +89 to +145, +150 to +171, +177 to +193, +223 to +228, +230 to +237, +239 to +247, +249 to +255, +257 to +261, +263 to +270, +272 to +279, +297 to +301, +303 to +313, +24 to 328, +1 to +328 of the sequence having the sequence ID No. 1.

3. The polypeptide according to claim 1 or 2, characterized in that the polypeptide has at least one mutation of the amino acid sequence with respect to sequence ID No. 1 in at least one of the following positions selected from the group: 22, 23, 25, 26, 27, 29, 31, 32, 35, 37, 42, 43, 46, 51, 53, 54, 57, 60, 69, 72, 73, 78, 80, 84, 88, 95, 97, 99, 114, 118, 119, 123, 132, 141, 146, 148, 149, 154, 163, 164, 165, 169, 170, 172, 176, 180, 182, 183, 190, 191, 194, 196, 197, 198, 201, 204, 205, 206, 207, 208, 209, 210, 212, 213, 214, 216, 217, 220, 221, 222, 229, 231, 233, 238, 240, 244, 245, 246, 248, 249, 251, 254, 256, 260, 262, 263, 266, 269, 271, 277, 280, 281, 282, 283, 284, 285, 286, 287, 292, 296, 298, 302, 307, 308, 309, 311, 314, 317, 319, 321, 323, 325 and 326.

4. The polypeptide according to any one of claims 1, 2 or 3, characterized in that it has at least one mutation of the amino acid sequence with respect to sequence ID No. 1 selected from the group D22A, S23Q, S23L, N25D, I26V, F27Y, F27H, S29P, R31A, F32Y, R35K, R35Q, V37A, V42I, V43T, F46Y, S51E, S51D, D53G, N54M, N54R, L57V, L60I, S69G, P72E, V73A, A78S, N80H, F84Y, I88L, T95S, T97A, R99K, I114M, I118V, K119R, V123I, L132V, A141S, I146V, I146L, A148G, A149V, A154P, P163T, A164T, Y165C, Y165H, V169I, L170R, A172G, A176M, A176V, Y180F, D182T, F183Y, I190V,

G191S, K194T, K194E, F196Y, V197C, V197R, E198R, E198S, K201D, K201G, P204S, P204A, A205S, K206P, A207M, M208A, Q209R, L210A, L210S, ΔP212, T213V, P214A, E216T, E216G, A217I, N220H, L221M, K222R, K222Q, G229A, A231V, F233W, F233Y, F233H, A238G, H240N, H240S, D244E, R245Q, M246L, S248T, S248N, S248G, Q249R, K251N, I254V, I256L, A260M, T262D, T262G, I263T, E266D, E269H, E269N, L271V, L277E, E280A, E280L, H281R, H281Q, A282V, Q283R, D284L, D284R, I285L, I286M, R287E, R287D, R292K, R292T, Q296A, Q296E, H298V, L302S, L307Q, F308S, D309A, A311P, A314V, L317F, S319Q, S319P, S319R, S321A, S321T, T323A, P325A, A326P.

5. The polypeptide according to any one of claims 1 to 4, characterized in that it contains at least one of the following amino acid motifs selected from the group of sequence ID numbers 32 to 69.

6. An additive that hydrolytically cleaves zearalenone and/or at least one zearalenone derivative to yield feed products for pigs, poultry or aquaculture, for addition to foodstuffs or to distillers dried grain and solubles, characterized in that the additive contains at least one polypeptide having an amino acid sequence ID No. 1 or a functional variant thereof, wherein a sequence identity between the functional variant and at least one of the amino acid sequences amounts to at least 84 % and auxiliary substances are also present.

7. The additive according to claim 6, characterized in that at least one polypeptide according to any one of the claims 1 to 5 is contained therein.

8. The additive according to claim 6 or 7, characterized in that the auxiliary substances are selected from at least one inert carrier as well as optional additional ingredients, such as vitamins and/or minerals and/or enzymes and/or other components for detoxifying mycotoxins.

9. The additive according to claim 6, 7 or 8, characterized in that at least one polypeptide according to any one of claims 1 to 5 is present in the additive in a concentration of at most 10,000 U/g, preferably at most 1000 U/g, more preferably at most 100 U/g and most preferably at most 10 U/g.

10. The additive according to any one of claims 6 to 9, characterized in that the additive is present in encapsulated or coated form.

11. A use of at least one polypeptide having an amino acid sequence ID No. 1 or a functional variant thereof, wherein additives containing a sequence identity between the functional variant and at least one of the amino acid sequences amounts to at least 84 %, for hydrolytic cleavage of zearalenone and/or at least one zearalenone derivative in animal feed products, in particular pigs, poultry and aquaculture, in food items or in distillers dried grain and solubles.

12. The method for hydrolytic cleavage of zearalenone and/or at least one zearalenone derivative, characterized in that the zearalenone and/or at least one zearalenone derivative is/are hydrolyzed by a polypeptide having an amino acid sequence ID No. 1 or a functional variant thereof, wherein the sequence identity between the functional variant and at least one of the amino acid sequences is at least 84 %.

13. The method according to claim 12, characterized in that the polypeptide is used in an additive according to any one of claims 6 to 10.

14. The method according to claim 13, characterized in that the polypeptide or the additive is mixed with a foodstuff or animal feed product contaminated with zearalenone and/or with at least one zearalenone derivative; the contaminated foodstuff or animal feed product is brought in contact with moisture, and the polypeptide or the additive hydrolyzes the zearalenone and/or at least one zearalenone derivative present in contaminated foodstuff or animal feed product.